List of Claims

1. A method of improving accuracy of a fuel injection event in a common rail fuel injection system, comprising the steps of:

determining a predetermined time that is sufficient to determine an injector control signal and set up an injector driver with said injector control signal;

sensing rail pressure at least ~~a~~ said predetermined time before a start of control signal for a succeeding injection event but after an end of control signal of an immediately preceding injection event; and

determining a succeeding injection event control signal based at least in part on a single rail pressure value, which is the sensed rail pressure.

2. The method of claim 1 wherein said sensing step is performed between rail pressure recovery events.

3. The method of claim 1 including a step of determining a timing at which to perform a rail pressure sensing event.

4. ~~The method of claim 3 wherein~~ A method of improving accuracy of a fuel injection event in a common rail fuel injection system, comprising the steps of:

determining a timing at which to perform a rail pressure sensing event;

sensing rail pressure at least a predetermined time before a start of control signal for a succeeding injection event but after an end of control signal of an immediately preceding injection event;

determining a succeeding injection event control signal based at least in part on the sensed rail pressure; and

said determining step is performed at least in part based on succeeding injection event data and engine speed.

5. ~~The method of claim 3 wherein~~ A method of improving accuracy of a fuel injection event in a common rail fuel injection system, comprising the steps of:

determining a timing at which to perform a rail pressure sensing event;

sensing rail pressure at least a predetermined time before a start of control signal for a succeeding injection event but after an end of control signal of an immediately preceding injection event;

determining a succeeding injection event control signal based at least in part on the sensed rail pressure; and

said determining step includes a step of setting the timing of a rail pressure sensing event at a fixed angle before top dead center.

6. The method of claim 5 wherein said setting the timing step includes a step of providing a marker on a rotating component of an engine.

7. ~~The method of claim 1 wherein~~ A method of improving accuracy of a fuel injection event in a common rail fuel injection system, comprising the steps of:

sensing rail pressure at least a predetermined time before a start of control signal for a succeeding injection event but after an end of control signal of an immediately preceding injection event;

determining a succeeding injection event control signal based at least in part on the sensed rail pressure; and

said sensing step is performed a predetermined angle before top dead center.

8. ~~The method of claim 1 wherein~~ A method of improving accuracy of a fuel injection event in a common rail fuel injection system, comprising the steps of:

sensing rail pressure at least a predetermined time before a start of control signal for a succeeding injection event but after an end of control signal of an immediately preceding injection event;

determining a succeeding injection event control signal based at least in part on the sensed rail pressure; and

said sensing step is performed between a determination of a succeeding injection event characteristic and determination of a succeeding injection event control signal.

9. A fuel injection system comprising:

a common rail containing a pressurized fluid;

a plurality of fuel injectors with inlets fluidly connected to said common rail; and

an electronic control module operably coupled to said fuel injectors and including a rail pressure determinator operable to determine rail pressure at least a predetermined time before a start of control signal for a succeeding injection event but after an end of control signal of an immediately preceding injection event, and being operable to determine a succeeding injection event control signal based at least in part on a single rail pressure value, which is the determined rail pressure; and

said predetermined time being an amount of time that is sufficient to determine an injector control signal and set up an injector driver with said injector control signal.

10. The fuel injection system of claim 9 wherein said electronic control module includes a rail pressure sensing event timing determinator.

11. ~~The fuel injection system of claim 10 wherein~~ A fuel injection system comprising:

a common rail containing a pressurized fluid;

a plurality of fuel injectors with inlets fluidly connected to said common rail;

an electronic control module operably coupled to said fuel injectors and including a rail pressure determinator operable to determine rail pressure at least a predetermined time before a start of control signal for a succeeding injection event but after an end of control signal of an immediately preceding injection event;

said electronic control module includes a rail pressure sensing event timing determinator; and

said rail pressure sensing event timing determinator includes an engine angle determinator operable to determine whether an engine is at a predetermined angle before top dead center.

12. The fuel injection system of claim 11 wherein said engine angle determinator includes a marker reader algorithm.

13. The fuel injection system of claim 11 wherein said predetermined angle is based at least partly on succeeding injection event data and engine speed.

14. The fuel injection system of claim 13 wherein said electronic control module includes a map of said predetermined angle versus succeeding injection event timing and engine speed.

15. ~~The fuel injection system of claim 9 wherein~~ A fuel injection system comprising:

a common rail containing a pressurized fluid;

a plurality of fuel injectors with inlets fluidly connected to said common rail;

an electronic control module operably coupled to said fuel injectors and including a rail pressure determinator operable to determine rail pressure at least a predetermined time before a start of control signal for a succeeding injection event but after an end of control signal of an immediately preceding injection event.; and

said rail pressure determinator is operable between determination of a succeeding injection event data and a determination of a succeeding injection event control signal.

16. An article comprising:

a computer readable data storage medium;

a rail pressure determinator stored on the medium and being operable to determine rail pressure at least a predetermined time before a start of control signal for a succeeding injection event but after an end of control signal of an immediately preceding injection event; and

a control signal determination algorithm stored on the medium and being operable to determine a succeeding injection event control signal based at least in part on a single rail pressure value, which is a sensed rail pressure generated by said rail pressure determinator.

17. The article of claim 16 including a rail pressure sensing event timing determinator stored on said medium.

18. The article of claim 17 wherein An article comprising:

a computer readable data storage medium;

a rail pressure determinator stored on the medium and being operable to determine rail pressure at least a predetermined time before a start of control signal for a succeeding injection event but after an end of control signal of an immediately preceding injection event; and

a control signal determination algorithm stored on the medium and being operable to determine a succeeding injection event control signal based at least in part on a sensed rail pressure generated by said rail pressure determinator;

a rail pressure sensing event timing determinator stored on said medium; and

said rail pressure sensing event timing determinator includes an engine angle determinator operable to determine whether an engine is at a predetermined angle before top dead center.

19. The article of claim 18 wherein said engine angle determinator includes a marker reader algorithm.

20. The article of claim 19 including a map of said predetermined angle versus succeeding injection event timing and engine speed stored on said medium.